

ordinary ascending currents of air such as commonly exist on summer days. It will be noticed that in both cases the objects started from a considerable elevation above sea level, where the currents had decided vertical velocity. It is probable that near the ground over a level country the air can have no great vertical motion, except in whirlwinds, so that phenomena of this kind are not observed. The kites flown at Blue Hill frequently give evidence of strong vertical uplift when they are at a considerable distance above the ground. On May 1, 1900, a kite weighing eleven pounds, carrying a meteorograph weighing three pounds, and 1000 feet of wire weighing about five pounds, was lifted to an angle of 90° above the horizon as measured by a theodolite, and remained in the vicinity of the zenith for nearly two minutes.

RECENT ADDITIONS TO THE WEATHER BUREAU LIBRARY.

C. FITZHUGH TALMAN, Acting Librarian.

The following titles have been selected from among the books recently received, as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies. Most of them can be loaned for a limited time to officials and employees who make application for them.

Bremen.

Deutsches meteorologisches Jahrbuch für 1904. Jahrg. XV. xii, 76 pp. 8°. Bremen. 1905.

Comité international des poids et mesures.

Procès-verbaux des séances. Session de 1905. vi, 243 pp. 8°. Paris. 1905.

Hamburg. Deutsche Seewarte.

Wind, Strom, Luft- und Wassertemperatur des Mittelmeeres. (Beilage zu den "Annalen der Hydrographie." 1905.) 60 pp. 4°. Berlin. [1905.]

Holland. Koninklijk Nederlandsch Meteorologisch Instituut.

Onweders, optische verschijnselen, enz., in Nederland, 1903. 101 pp. 8°. Amsterdam. 1905.

Natal. Government Astronomer.

Report of the Government Astronomer, 1904. 55 pp. 8°. Pietermaritzburg. 1905.

Observatoire magnétique et météorologique de Zi-Ka-Wei.

Bulletin des observations. Année 1902. xii, 221 pp. 8°. Chang-Hai. 1905.

Riabouchinsky, D.

Institut aérodynamique de Koutchino [Description of]. 8 pp. 8°. St. Petersburg. 1905.

Schubert, Johannes.

Der Wärmeaustausch im festen Erdboden, in Gewässern und in der Atmosphäre. 30 pp. 8°. Berlin. 1904.

Wald und Niederschlag in Westpreussen und Posen. 15 pp. 8°. Eberswalde. 1905.

South Australia. Government Astronomer, etc.

Meteorological observations made at the Adelaide Observatory and other places in South Australia and the Northern Territory during the year 1891. xvi, 91 pp. 8°. Adelaide. 1902.
[Same for] 1900-1901. xx, 167 pp. 8°. Adelaide. 1904.

Udden, Johan August.

On the cyclonic distribution of rainfall. 21 pp. 4°. Rock Island. 1905.

Walz, F. J.

Fake weather forecasts. (Reprinted from Popular Science Monthly, October, 1905.) Pp. 503-513.

Western Australia. Government Astronomer.

Meteorological observations made at the Perth Observatory and other places in Western Australia during the year 1902. 143 pp. 8°. Perth. 1903.

Yearbook of scientific and learned societies of Great Britain and Ireland, 1904. vi, 300 pp. 8°. London. 1905.

RECENT PAPERS BEARING ON METEOROLOGY.

C. FITZHUGH TALMAN, Acting Librarian.

The subjoined titles have been selected from the contents of the periodicals and serials recently received in the Library of the Weather Bureau. The titles selected are of papers or other communications bearing on meteorology or cognate branches of science. This is not a complete index of the meteorological contents of all the journals from which it has been compiled; it shows only the articles that appear to the

compiler likely to be of particular interest in connection with the work of the Weather Bureau. Unsigned articles are indicated by a —

American Journal of Science. New Haven. 4th Series. Vol. 20.

Barus, Carl. On groups of efficient nuclei in dust-free air. Pp. 297-300.

Bulletin of the American Geographical Society. New York. Vol. 37.

Peary, R[obert] E[dwin]. Peary Arctic Club expedition, summer of 1905. Pp. 594-600.

W[ard], R[obert] DeC[ourcy]. Antarctic meteorology. [Note on paper by R. C. Mossman in Symons met. mag., June, 1905.] Pp. 613-614.

W[ard], R[obert] DeC[ourcy]. Chilean meteorology. Pp. 606-607.

W[ard], R[obert] DeC[ourcy]. Climate and weather of Turkestan. [Review of Explorations in Turkestan. By Pumpelly, W. M. Davis, and E. Huntington.] Pp. 608-609.

W[ard], R[obert] DeC[ourcy]. Flow of the Thames in relation to pressure and rainfall changes. [Note on paper by W. J. S. Lockyer in Nature, June 22, 1905.] P. 611.

W[ard], R[obert] DeC[ourcy]. Inversions of temperature on Ben Nevis. [Note on paper by A. Watt in Nature, v. 71, p. 583.] Pp. 611-612.

W[ard], R[obert] DeC[ourcy]. Meteorological results of the Nansen expedition. [Review of the Norwegian North Polar expedition, 1893-1896. Scientific results; vol. 6, Meteorology. By H. Mohn.] Pp. 629-632.

W[ard], R[obert] DeC[ourcy]. Meteorology of India, 1892-1902. P. 609.

W[ard], R[obert] DeC[ourcy]. Nile basin rains. [Review of Rains of the Nile basin in 1904. By H. G. Lyons.] Pp. 600-601.

Physical Review. Lancaster. Vol. 21.

Holborn, L., and Austin L. W. On the specific heat of gases at high temperatures. Pp. 209-228.

Scientific American. New York. Vol. 93.

— Apparatus for observing and automatically registering thunderstorms. P. 278.

— Dufaux flying machine. P. 316.

— Long-distance balloon race from Liege. P. 278.

— Prevention of hailstorms. A review of recent experiments. P. 322.

Terrestrial Magnetism and Atmospheric Electricity. Baltimore. Vol. 10.

Burbank, J. E. Specific electrical conductivity of the air at sea. P. 126-129.

Western Electrician. Chicago. Vol. 37.

— Effect on atmospheric electricity of the eruption of Mount Pelée. P. 274.

Geographical Journal. London. Vol. 26.

Lyons, H. G. On the Nile flood and its variation. Pp. 395-421. Continued from P. 272.

Science Abstracts. London. Vol. 8.

Ros[enhain], W. Direct-reading resistance thermometers. Composite thermo-couples. [Abstract from A. Campbell, Phys. soc. proc., v. 19, p. 555-565.] P. 571.

Archives des Sciences Physiques et Naturelles. Genève. 4 Période. Tome 20.

Bjerknes, V. Sur la formation des tourbillons dans un fluide sans frottement avec une application à l'analogie des phénomènes hydrodynamiques et électrostatiques. Pp. 268-284.

— Observations météorologiques faites aux fortifications de Saint Maurice pendant les mois de mars, avril, et mai, 1905. Pp. 285-292.

Comptes Rendus de l'Académie des Sciences. Paris. Tome 141.

De la Vaulx, Henry and Jaubert, Joseph. Sur les observations météorologiques faites à Constantine pendant l'éclipse du 30 août, 1905. Pp. 512-513.

Deslandres, H. Note préliminaire sur l'observation de l'éclipse totale du soleil du 30 août 1905, à Burgos. Pp. 517-518.

Eginitis, D. Observation de l'éclipse solaire du 30 août à Athènes. Pp. 520-521.

Libert, Lucien. Sur le phénomène des ombres volantes. P. 513-514.

Meslin, Georges. Sur l'éclipse du 30 août 1905 et sur la polarisation de la couronne solaire. P. 493-496.

Moureau, Th. Trombe du 28 août 1905 à Saint-Maur et à Champigny (Seine). Pp. 510-511.

Monaco, Albert, Prince de. Sur les lancements de ballons sondes et de ballons pilotes au-dessus des océans. Pp. 492-493.

Rayet, C. Éclipse totale du soleil du 30 août 1905. Pp. 490-491.

Salet. Observation de l'éclipse totale du 30 août 1905 faite à Robertville (Algérie). Pp. 528.

L'Aérophile. Paris. 13 année.

Nicolléau, A. Le Santos-Dumont XIV à Trouville. Pp. 200-201.

Goupil, A. Calculs sur l'aéroplane de M. Archdeacon. Pp. 207-209.

Masfrand, A. de. Aéroneutes et l'éclipse du 30 août 1905. Pp. 202-206.

Ciel et Terre. Bruxelles. 26 année.

Lancaster, A. Eclipse totale du soleil du 30 août 1905. Pp. 329-346. Continued from p. 273.

La Géographie. Paris. Tome 12.

Laloy, L. Evaporation de l'eau profonde dans les steppes et spécialement dans l'Afrique du Sud-Ouest. P. 53-55.

Lemoine, Frédéric. Expédition antarctique française, par le docteur Jean Charcot. P. 74.

La Nature. Paris. 33 année.

Esptallier, G. Le "Santos-Dumont XIV." P. 257.

Libert, Lucien. Observatoire du Vésuve. P. 276.

Illustrierte Aeronautische Mitteilungen. Strassburg. 9 Jahrgang.

Herring, A. M. Prinzip und die Zukunft der Flugmaschine. [Translated from "Gas Power."] Pp. 318-325.

Rosenthal, Elmar. Kusnetsowsche Drache. Pp. 325-327.

Scheimpflug, Th. Zur Stabilitätstheorie der Drachen. Pp. 327-329.

— Übersicht über die Beteiligung an den internationalen Aufstiegen im Januar, Februar, März, und April. Pp. 316-318.

Naturwissenschaftliche Rundschau. Berlin. 20 Jahrgang.

Hergesell, H. Neue Beobachtungen über die meteorologischen Verhältnisse der hohen wärmeren Luftschicht. [Abstract from Beiträge zur Physik der freien Atmosphäre 1905, Bd. I. P. 142-146.] P. 486.

Krebs, Wilhelm. Cyclones of the far east. [Review of work by José Algué.] Pp. 476-478.

Petermanns Mitteilungen. Gotha. 51 Band.

Easton, O. Zur Periodizität der solaren und klimatischen Schwankungen. Pp. 169-176.

Fischer, Franz J. Wasserstandsbeziehung in den norddeutschen Flussgebieten im hydrologischen Jahre 1901. P. 187-189.

Kassner, K. Temperaturverteilung in Bulgarien. Pp. 176-180.

Sapper, K. Possible relation between sunspots and volcanic and seismic phenomena. By H. J. Jensen. [Review.] Literaturbericht. P. 141.

Physikalische Zeitschrift. Leipzig. 6 Jahrgang.

Gockel, A. Luftpotelektrische Beobachtungen während der Sonnenfinsternis vom 30 August, 1905. P. 617-618.

Magri, L. Brechungsindex der Luft in seiner Beziehung zu ihre Dichte. Pp. 629-632.

Das Weltall. Berlin. 5 Jahrgang.

Archenhold, F. S. Vorläufige Mitteilung über unsere Beobachtungen der totalen Sonnenfinsternis am 30 August 1905 in Burgos. Pp. 415-416.

Das Wetter. Berlin. 22 Jahrgang.

Coym, A. Aufstiege vom 28 bis 31 August 1905 am Königlichen Aeronautischen Observatorium Lindenberg. Pp. 198-202.

Lindemann, Abweichungen der Tagesmittel der Temperatur aus den Terminbeobachtungen 6a, 2p, 9p, und 8a, 2p, 8p, von den 24 stündigen Mittelwerten. P. 202-204.

Schiefer, Eduard. Juli-Gewitter d. J. in Böhmen. P. 206-209.

Stentzel, Arthur. Purpurlicht. Pp. 193-198.

Boletim da Sociedade de Geographia de Lisboa. Lisboa. 23 série.

Observatorio Meteorologico e Magnetico de Loanda. Resumo das observacoes. 1903. Pp. 298-299.

THE WEST INDIAN HURRICANE OF AUGUST 11, 1903.

By MAXWELL HALL, Esq. Dated Montego Bay, Jamaica, August 14, 1905.¹

I. THE HISTORY OF THE HURRICANE BEFORE AUGUST 11.

The first intimations we had in Jamaica of this great storm came from the Weather Bureau at Washington, and the following notices were posted in Kingston by the local branch of that Bureau:

August 8, 11:30 a. m.—Washington Weather Bureau notifies evidence of a disturbance ESE. of Barbados, moving N. of W.

August 8, 4 p. m.—Central Bureau, Washington, notifies that the disturbance E. of Barbados will move NW. over the Windward Islands. It is probably of dangerous strength.

August 10, 4:15 p. m.—The following has been received from the Central Bureau in Washington: Disturbance apparent; marked strength; moving N. of W. over or near Santo Domingo. Reports from Santo Domingo missing.

But as a matter of fact the hurricane moved in a straight line from Martinique to Jamaica, and then over Cayman Islands and Yucatan to the coast of Mexico where it disappeared. The following extracts are taken from the account given by Professor Garriott in the United States MONTHLY WEATHER REVIEW for August, 1903:

¹ In editing this article the Editor has, with the author's permission, substituted "hurricane" for "cyclone" as the text applies specifically to the former.

Martinique appears to be the only island of the Windward group that suffered serious damage. The vortex of the storm passed over or near that island moving in a northwesterly direction during the night of the 8-9th, unroofing several hundred houses, destroying crops, and damaging a number of sailing vessels.

Reports from Kingston, Jamaica, show that the first effects of the storm were felt on that island on the 10th, and that the main hurricane center reached the island on the morning of the 11th, causing a heavy loss of life and property. At Kingston the minimum barometer, 28.80 inches, as indicated by the barograph, occurred at 5:30 a. m. of the 11th, and at 6:15 a. m. the barometer had risen to 29.36. The anemometer cups were disabled, but the maximum wind velocity at Kingston was estimated at 65 miles an hour. The principal sufferers were the owners of banana plantations whose losses were estimated at more than £500,000. The orange, pimento, and coffee crops suffered severely; the towns of Port Antonio and Port Maria were almost destroyed, and throughout the parishes of St. Mary, Portland, St. Andrew, St. Catherine, and St. Thomas the destruction of houses, property, and plantations was appalling. Kingston, with the exception of damage to houses and warehouses on the sea front, suffered less than any other place on the island.

Later advices show that the Cayman Islands were devastated on the evening of the 11th. Captain Hunter, of the schooner *Governor Blake*, has furnished notes regarding the storm at Georgetown, Grand Cayman Island. According to his observations the 8th and 9th were clear and bright at Grand Cayman Island. The 10th was unusually warm with a NNE. wind that freshened steadily. In the afternoon the weather became cloudy and a little rain fell in the evening. From 8 a. m. to 8 p. m., local time, the barometer fell from 29.80 to 29.70 inches. At 1 p. m. of the 11th the barometer read 29.50 inches, the wind was blowing about 30 miles an hour from the NNE. and the sky was covered with thick, black clouds from the same quarter. At 4 p. m. the wind was blowing about 45 miles an hour, and at 5 p. m., with the barometer at 29.30 inches, the wind was blowing in heavy gusts at 65 miles, and the clouds hung so low that they seemed to almost touch the tree tops. At 7 p. m. the roaring of the wind began, and at 8 p. m., with the barometer reading 29.00, the wind blew at 90 miles an hour in terrific gusts that churned up the water in the harbor of Georgetown and blew out to sea or capsized several vessels. At this time, 8 p. m., it was supposed that the worst of the storm had passed, but soon the barometer began to fall so rapidly that the needle of the aneroid could be seen to move. The barometer fell until 10 p. m., when it stood at 28.30 inches with the wind blowing 110 to 120 miles an hour from ENE. to ESE. in gusts. About midnight it became almost calm for about 30 minutes, after which the wind came on fiercely from the SE. At 1 a. m. of the 12th the barometer began to rise, and at 6 a. m. it read 29.30, and at noon 29.70.

About 200 houses were blown down or unroofed, seven out of eight churches on the island were destroyed, vessels on the stocks were picked up and dashed to pieces, and of the 23 vessels in the harbor of Georgetown but one, the *Governor Blake*, was saved. Most of the crews on board perished, but no one on shore was killed.

From the cyclonic point of view this story requires the following explanatory note.

On the 11th at 5 p. m. the schooner *Governor Blake*, with Captain Hunter on board, parted her cable in Georgetown Harbor, and scudded to the south before the hurricane; and from the above account it will be seen that the *Governor Blake* got involved in the worst part of the storm, and was not thrown out, or left behind, until 1 a. m. on the 12th. She returned to Georgetown after a few days, having made several gallant rescues.

From other sources we learn that at Georgetown the hurricane raged with appalling violence from 9 to 11 o'clock, the wind veering from NE. to SE., so that the center must have passed a few miles to the south of the town at about 10 p. m.

Now the distance from Martinique to Kingston, Jamaica, is about 1095 miles; the distance from Kingston to Montego Bay is 83 miles; the distance from Montego Bay to Grand Cayman Island is 238 miles. As the center passed over Montego Bay at 9:30 a. m., we have the following velocities of the center along its course: from Martinique to Kingston, twenty miles an hour; from Kingston to Montego Bay, twenty-one miles an hour; and from Montego Bay to Grand Cayman Island, nineteen miles an hour. Hence, we shall assume that the center proceeded from Martinique to Grand Cayman Island at a uniform velocity of twenty miles an hour.

The accompanying chart, fig. 1, shows the position of the center of the hurricane at Greenwich, mean noon daily, from the 9th to the 12th, and the corresponding approximate local times.